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CASE REPORT

A Rare and Fatal Association With SLE: Lutembacher Syndrome With Huge Atrial Septal Defect

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Introduction

Systemic lupus erythematosus (SLE) is an autoimmune disorder characterized by periods of relapse and remission, with the potential to damage multiple organs depending on disease activity and individual susceptibility.[1] Valvular heart disease is one of the cardiac manifestations associated with SLE.[2] Lutembacher syndrome (LS) is an exceedingly rare clinical syndrome defined by the presence of a combination of congenital or acquired ostium secundum atrial septal defect (ASD) and congenital or acquired mitral stenosis (MS).[3] First reported by Lutembacher in 1916, this syndrome is more frequently observed in young adults, with a higher prevalence among females.[4] In this case report, we present the case of a young pregnant woman with SLE who visited the cardiology clinic complaining of palpitations. Eventually, she was diagnosed with LS.

Case presentation

A 26-year-old woman, 20 weeks pregnant and with a past medical history of SLE, presented to the cardiology clinic with shortness of breath, palpitations, and fatigue. She was classified as New York Heart Association-Class III. Approximately a year ago, she began experiencing breathlessness during physical activity, palpitations, and tightness in her chest, but she did not seek medical attention at that time. Her routine medication before admission was hydroxychloroquine. The patient's heart rate was 125 bpm, blood pressure was 147/97, and respiratory rate was 27 breaths per minute; she was afebrile.

During the physical examination, after heart rate normalization, the patient exhibited a split-second heart sound and a loud P2. A mid-diastolic murmur with a low-pitched rumbling quality was heard, along with a high-pitched holosystolic murmur extending from the apex to the axilla. Additionally, an ejection systolic murmur was present at the upper left sternal border. Fine inspiratory crackles were heard in the lower part of both lungs during a chest examination.

A 12-lead electrocardiogram showed atrial tachycardia, right axis deviation, complete right bundle branch block, and right ventricular hypertrophy.

On transthoracic echocardiography, the left and right atria were significantly dilated, and a large ASD measuring 2.94 cm was identified (Figure 1). The left ventricle had normal dimensions and systolic function. The mitral valve leaflets were prolapsed and thickened, demonstrating restricted mobility with a mitral valve area of 1.4 cm2 on planimetry. The morphology of the anterior mitral leaflet, resembling a hockey stick shape, suggests a potentially rheumatic origin. (Figure 2). The tricuspid valve exhibited a fibrotic morphology, severe tricuspid regurgitation (maximum tricuspid regurgitation velocity at 3.3 m/s), a dilated inferior vena cava (3.0 cm), and collapse <40% during inspiration. The Tricuspid annular plane systolic excursion was 19.5 mm, and peak systolic myocardial velocity by Doppler tissue imaging was 12 cm/s. The patient's right ventricular function was normal. The pulmonary valve had a normal morphology, and the main pulmonary artery was dilated (diameter of 30.2 cm) along with its branches, indicating severe pulmonary hypertension (PH). The aortic valve appeared normal, and there was a mild pericardial effusion. On

Keywords

Atrial Heart Septal Defects; Case Reports; Systemic Lupus Erythematosus; Lutembacher Syndrome

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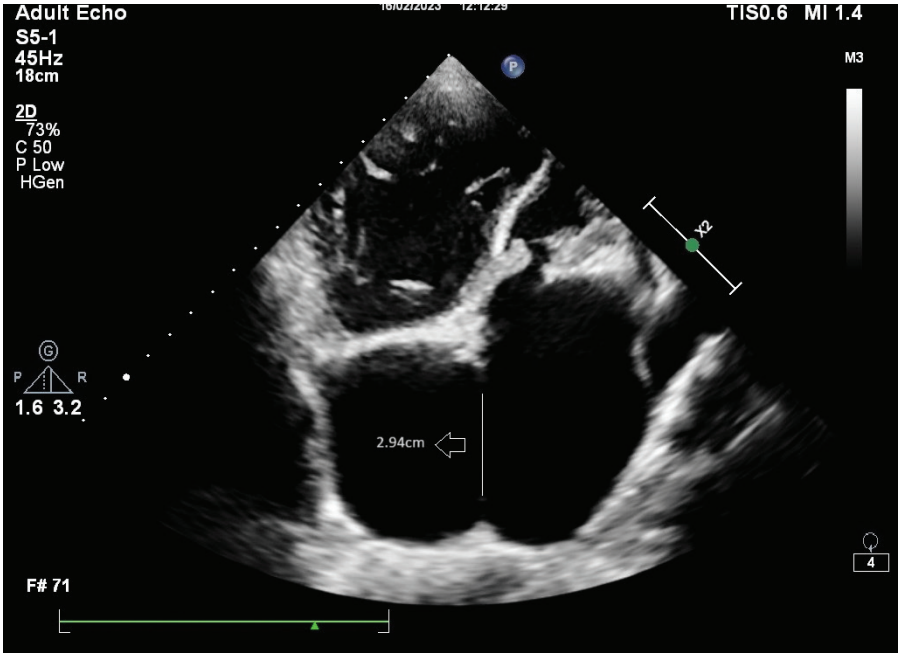

Figure 1 – A huge ASD with a dimension of 3.1 cm and MS. LS is an extremely rare clinical condition characterized by the coexistence of congenital or acquired ostium secundum ASD and congenital or acquired MS.

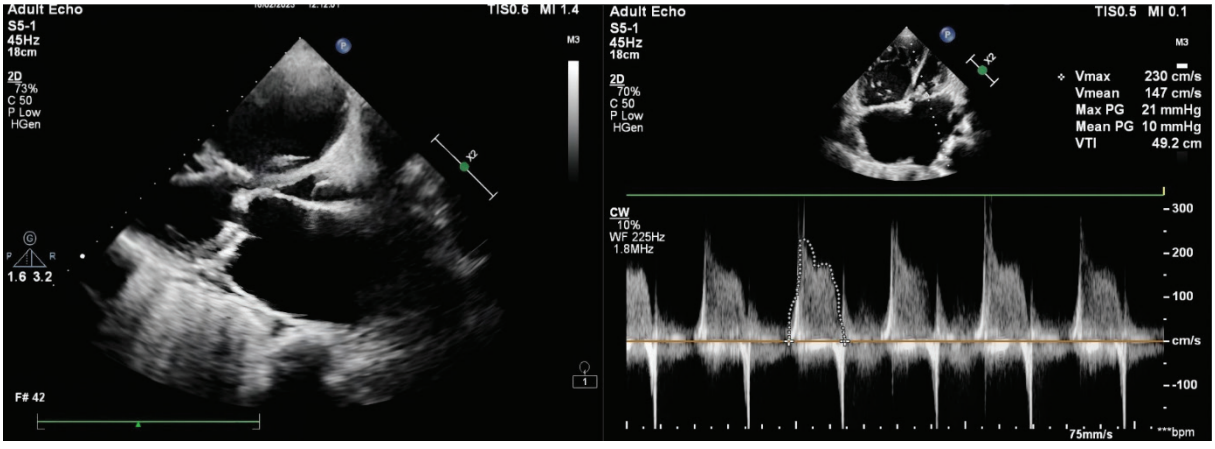

Figure 2 – The maximal gradient for MS is 21 mmHg, and the mean gradient is 12 mmHg. The anterior mitral leaflet exhibited a morphology resembling a hockey stick, indicative of a potential rheumatic origin.

transesophageal echocardiography, severe tricuspid regurgitation and a huge ASD measuring 3.1 cm were observed (Figure 3). The mitral valve leaflets appeared rheumatic, thickened, and restricted in motion. The mitral valve area measured 1.3 cm^2 on planimetry.

The patient, classified as Class 4 in the Modified WHO Classification of Maternal Cardiovascular Risk due to PH, was 20 weeks pregnant despite the contraindications for pregnancy in such cases. Following administration of diuretics, her symptoms improved, and she was monitored as NYHA Class I. While termination of the pregnancy was discussed with the family, it was ultimately not pursued. After these examinations, the patient was discharged with hydroxychloroquine 200 mg

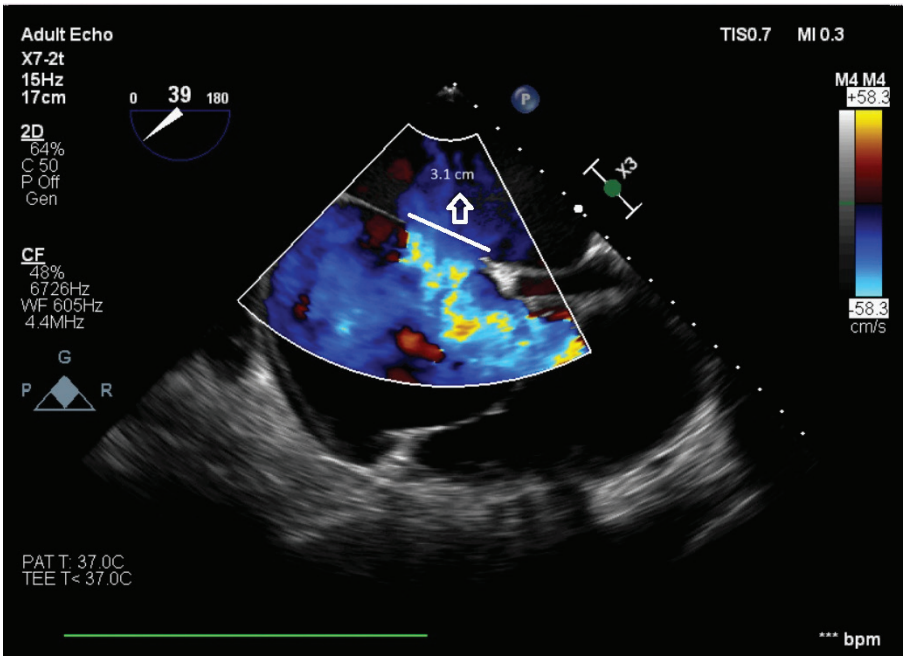

Figure 3 – A huge ASD, with a calculated diameter of 3.1 cm, was observed on the transesophageal echocardiography, revealing a weak aortic rim.

twice a day for SLE, metoprolol 100 mg daily, and enoxaparin 6000 IU twice a day. The patient attended cardiology follow-ups once a month until the last four weeks before delivery, after which her visits increased to twice a month. She was monitored closely throughout her pregnancy.

Before delivery, the patient was seen by the obstetrics team. We recommended a normal vaginal delivery with a shortened second stage. Unfortunately, due to a suspected placental abruption, the patient underwent a cesarean section under general anesthesia and delivered a healthy 2420-gram baby. Following delivery, the patient was monitored in the intensive care unit for one day and then in the obstetrics clinic for two days before being discharged. There were no cardiac symptoms or complications during or after delivery.

Two months after delivery, the patient returned to the emergency service with breathlessness, orthopnea, and abdominal distention. Her symptoms were classified as NYHA class III by the cardiology clinic, and after diuretic treatment, she was stabilized. Right heart catheterization and coronary angiography were done, showing normal coronary anatomy, and her Pulmonary vascular resistance (PVR) was 7 on catheterization (Table 1).

Table 1 – Results of Right Heart Catheterization

Aortic Pressure	115/64 mmHg
Left Ventricle Pressure	125/5/10 mmHg
Pulmonary Artery Pressure	56/23 /35 mmHg
Right Ventricle Pressure and Right Atrial pressure	62 /12 mmHg and 11 mmHg
Heart Rate	97 bpm
Hb	14.4 g/dl
Vena Cava Superior 02 Saturation	52%
Vena Cava Inferior 02 Saturation	61%
Right Atrium 02 Saturation:	55.5%
PVR	7.08 Woods
Cardiac Output	3.1 Lt/min
QP/OS Ratio	2.8
Pulmonary vasoreactivity testing with inhaled iloprost	Negative

Hb:Hemoglobin; PVR:Pulmonary vascular resistance; QP/QS : pulmonary output and systemic output ratio.

Thoracic computed tomography was performed to demonstrate lupus findings in the lungs. CT revealed a mosaic pattern, funicular opacity, interlobular septal thickening, and pleural effusion (Figure 4). Her medications were adjusted to include metoprolol 200 mg/day, furosemide 40 mg/day, rivaroxaban 20 mg/day, macitentan 10 mg/day, and sildenafil 60 mg/day. After one month, selexipag was added to her medications.

Mitral valvuloplasty was recommended for the patient after careful consideration, with full disclosure regarding the potential risk of mitral regurgitation. Given her underlying lupus-related lung disease, mitral regurgitation presented a heightened risk of morbidity. Consequently, the patient declined the procedure due to the associated risks.

Her case was discussed by a council composed of cardiology, rheumatology, cardiothoracic surgery, and pulmonology doctors. Percutaneous mitral balloon valvotomy or surgery, as well as percutaneous or surgical ASD closure, were not considered due to the pulmonary effects of SLE and the high pulmonary vascular resistance observed during right heart catheterization. The primary opinion after the council discussion was heart and lung transplantation. She was recommended for heart and lung transplantation application.

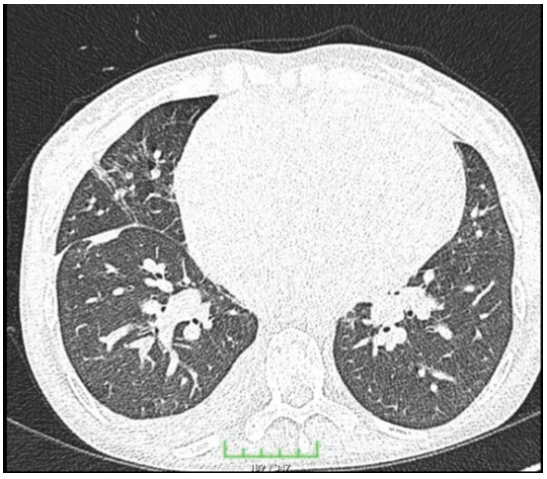

Figure 4 – The Computed Tomography scan revealed a mosaic pattern, funicular opacities, thickening of the interlobular septa, and pleural effusion. These findings suggest the presence of lung disease associated with SLE.

Discussion

The incidence of SLE varies from 1 to 25 per 100,000 persons in America and Europe. The disease is most commonly observed in young women and can affect various organ systems such as the heart, lungs, eyes, kidneys, and gastrointestinal tract. The prevalence of cardiovascular pathologies in patients with a diagnosis of SLE is estimated at 6-8%.[1] Heart diseases and cancer are the primary causes of mortality among individuals with SLE, with the cardiovascular system being strongly associated with high mortality, leading to premature atherosclerosis and complications like endocarditis and valve disease.[5] Valvular involvement is a common and clinically significant form of cardiac manifestation in SLE. Around 40-60% of SLE patients exhibit valvular alterations based on echocardiography, while autopsy studies show a frequency range of 13-74%. A meta-analysis published by Hussain et al. in 2023 found that, regardless of the specific valve involved, regurgitant lesions were the most commonly observed type of valvular dysfunction. The mitral valve was most commonly involved, with 19.7% of lesions being MR. Mitral valve prolapse was found in 9.25% of the lesions, whereas MS was less commonly seen (2.37%).[2] In our case report, the patient has rheumatic MS, but SLE could also contribute to MS. MS in this patient may result from a combination of rheumatic and SLE-related processes.

LS was initially identified and defined in 1916. It is characterized by the presence of any combination of ASD, which can be either congenital or caused by medical procedures, and mitral valve stenosis, which can be either congenital or acquired.[6] The hemodynamic consequences of LS are influenced by several factors, including the extent of MS, the ASD size, pulmonary vascular resistance, and right ventricular compliance. The presence of MS can increase the left-to-right shunt created by the ASD, leading to atrial dilatation, PH, and the development of Eisenmenger syndrome.[4] This predisposes patients to atrial arrhythmias, commonly atrial fibrillation, and most patients present with palpitations. In our case report, LS led to atrial dilatation and PH. PH is a medical condition where there is an increase in pressure in the pulmonary arteries due to various diseases. PH associated with connective tissue disorders (CTD) ranks as the second most prevalent cause of pulmonary arterial hypertension (PAH), following idiopathic PAH (group I). Among CTD-associated PH cases, systemic scleroderma constitutes 75%, with SLE and mixed connective tissue disease following thereafter.[7] Our case report details a patient with SLE

and SLE lung complications, along with PH. Further investigations revealed additional factors contributing to PH, including a shunt due to atrial defect, MS, and LS. The complexity of these conditions suggests a multifactorial etiology for the patient's PH.

One of the biggest challenges in our case report is pregnancy. Heart disease occurs in 1–4% of pregnancies, and it is the foremost cause of maternal mortality.[8]

Pregnancy and labor pose substantial risks to cardiac health, especially for women with PAH, who are advised to avoid pregnancy or consider early termination due to these high risks. Pregnancy increases blood volume by approximately 40%, accompanied by elevated cardiac output, expanded plasma and red cell mass, and reduced systemic vascular resistance that peaks around 24 weeks. These adaptations can lead to edema, hypotension, and heightened susceptibility to rhythm disturbances. During labor, significant hemodynamic changes—such as increased heart rate, central venous pressure, and cardiac output — increase the risk of cardiovascular collapse due to blood loss, uterine contractions, withdrawal of sympathetic tone, or potential right ventricular failure.[9] Pregnant women may present with cardiac symptoms like dyspnea, fatigue, palpitations, and orthopnea. When encountering such symptoms, clinicians should consider cardiometabolic diseases, including hypertensive disorders, gestational diabetes mellitus, thromboembolic disorders, ischemic heart disease, peripartum cardiomyopathy, endocarditis, aortic disease, and arrhythmias, as differential diagnoses. Medications must be carefully arranged during pregnancy and gestation, which significantly restricts optimal medical treatments. In our case report, the patient stopped breastfeeding her baby three months after delivery.

Mitral balloon valvuloplasty is the recommended first-line treatment for MS in appropriate patients. In our case, we proposed this high-risk procedure due to the severity of the MS. The patient's lung imaging revealed a mosaic pattern, nodular opacities, and findings suggestive of alveolar hemorrhage. Due to these pulmonary complications, the patient was unable to accept the life-threatening risks associated with the procedure. Following right heart catheterization, ASD closure was not pursued due to elevated pulmonary vascular resistance values. If the patient had consented to mitral valvuloplasty and her PVR had subsequently decreased, fenestrated ASD closure could have been considered as a future option. Heart and lung transplantation remains a complex and time-intensive consideration; in this case, the council factored in the patient's age and comorbidities, ultimately recommending combined heart and lung transplantation.

Patients with SLE may experience new-onset symptoms such as palpitations, dyspnea, exercise intolerance, and chest pain. These symptoms may be the first clues to cardiac manifestations. Thorough questioning of cardiac symptoms is essential for all SLE patients. In our case report, the patient had new-onset dyspnea and palpitations, leading to the diagnosis of the rare association of SLE with LS. Our case report is further complicated by pregnancy. MS, ASD, PH, pregnancy, and SLE are significant conditions on their own. In our case report, these comorbidities and pregnancy are seen together. All medications and treatment stages require multidisciplinary approval in this challenging case. Our case report highlights the very rare association of SLE disease with LS detected during pregnancy. The patient requires pulmonary and cardiac transplantation to be cured. Currently, she is on the organ transplant waiting list.

Author Contributions

Conception and design of the research: Kaleli MF; writing of the manuscript: Kaleli MF, Alsancak Y; critical revision of the manuscript for intellectual content: Alsancak Y, Celik M, Düzenli MA.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

This study is not associated with any thesis or dissertation work.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the Necmettin Erbakan University under the protocol number 2025/5564 (ID: 23348). All the procedures in this study were in accordance with the 1975 Helsinki Declaration, updated in 2013. Informed consent was obtained from all participants included in the study.

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